

3.6 Parcel 34 – Bldg 2567

3.6.1 Site Description

Bldg 2567 is a combination mini-mart and gasoline station located at the corner of Hope Road and Laboratory Road in the CWA. Bldg 2567 is a one-story building built on slab and is approximately 1,335 square feet in size. The facility sells gasoline and other household commodities to active, reserve, and retired military personnel and their dependents. No automotive repair work is conducted at this site. The gasoline portion of the facility consists of three USTs and two fuel dispensing pumps. Each pump is equipped with six hose attachments for dispensing fuel. All three tanks are 10,000 gallons in capacity and store various grades of unleaded gasoline.

The tanks and piping at the site are constructed of double-walled fiberglass. Continuous leak detection monitoring at the site is accomplished through the use of liquid leak sensors that have been placed in the interstitial spaces of the tanks and piping. Automatic tank gauges have also been installed within the tanks, which continuously monitor the product levels within each tank (28). Additional information pertaining to this parcel can be found in Section 5.2.1.3 and Section 5.4 of the Phase I ECP (1).

3.6.2 Previous Investigations

Bldg 2567 has been investigated under the FTMM IRP and is designated as Site FTMM-58. Four single-walled steel gasoline USTs were replaced by the existing tanks as part of a renovation project that was initiated as a result of one UST failing a tightness test. Tank removals involving these four single-walled steel gasoline USTs included three 10,000-gallon gasoline USTs and one 6,000-gallon gasoline UST. The four gasoline USTs were removed in February 1993. Two other tank removals, one 1,000-gallon heating oil UST and one 550-gallon used oil UST, were also removed as part of the renovation project. The heating oil and used oil USTs were both removed in December 1991.

Approximately 1,000 cubic yards of petroleum-contaminated soil were excavated and stockpiled for off-site disposal. A preliminary assessment was conducted at the site, and five monitoring wells were installed. Groundwater samples have been collected and analyzed for VOA+15 and lead. Benzene, 1,2-DCE, MTBE, and lead were initially detected above NJDEP GWQC.

Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. Benzene, xylenes, tert-butyl alcohol (TBA), and MTBE were detected in two of the five site monitoring wells above NJDEP GWQC. A remedial design that addresses groundwater contamination was submitted to the NJDEP. The remedial approach selected for the Bldg 2567 site involves the use of monitored natural attenuation. A Classification Exception Area (CEA) for site groundwater was filed with the NJDEP. A Geoprobe® investigation was performed in early 2004 to further evaluate site groundwater conditions. An RI report summarizing these findings was prepared

and was submitted to the NJDEP in February 2006. The Army is waiting for NJDEP approval of this document. Currently, as part of a monitoring program, seven groundwater monitoring wells are sampled on a quarterly basis. Due to the installation being selected for closure under the 2005 BRAC program, the cleanup strategy was re-evaluated. The current cleanup strategy includes oxygen release compound (ORC) injections and the continued monitoring of groundwater as a key component of the monitored natural attenuation program. Injection of ORC is subject to requirements pursuant to N.J.A.C. 7:26E-4.1(a)4 and N.J.A.C. 7:26E-6.3(c) related to the performance of a pilot study and approval of a permit-by-rule. ORC injections will be performed in 2008. Site closeout is anticipated for 2011.

3.6.3 Site Investigation Sampling

Through previous investigations conducted under the IRP, groundwater VO contamination has been identified in close proximity to Bldg 2567. Per NJDEP guidance and consistent with USEPA policy, the NJDEP recommends investigation of VI where structures are within 100 ft horizontally or vertically of shallow groundwater contamination in excess of GWSLs. In the case of petroleum hydrocarbon contamination (particularly BTEX), a 30-ft distance criterion is utilized (12). Benzene, DCE, and MTBE have been detected in groundwater above the GWSLs proximal to Bldg 2567. Therefore, VI at Bldg 2567 was further evaluated through the collection of near-slab and sub-slab soil gas samples.

See **Table 3.6-1** for a summary of field activities conducted for Parcel 34 as part of this SI and **Figure 3.6-1** for sample locations. A summary of the analytical and sampling program, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.6-2**.

Table 3.6-1
Parcel 34 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
34SG-1 (1 sample)	Sub-slab soil gas	One sub-slab soil gas sample was collected from under Bldg 2567. Because this is a mini-mart associated with an active fueling station, sub-slab soil gas was sampled in lieu of indoor air.	NJDEP – SRWM USEPA TO-15 Method
34SG-2 and 3 (3 samples – includes 1 duplicate sample)	Near-slab soil gas	Two near-slab soil gas samples were collected at Bldg 2567.	NJDEP – SRWM USEPA TO-15 Method

3.6.4 Site Investigation Results

A total of 20 VOs were detected in soil gas samples collected in Parcel 34. Of the 20 VOs detected, one (benzene) exceeded the NJDEP Soil Gas NRS of $26 \mu\text{g}/\text{m}^3$ in one near-slab soil gas sample. No constituents were detected above the NJDEP Soil Gas NRS in sub-slab soil gas sample 34SG-1. As presented in **Table 3.6-3**, benzene was detected at concentrations of $28 \mu\text{g}/\text{m}^3$ and $36.7 \mu\text{g}/\text{m}^3$ in sample 34SG-3 and a duplicate sample collected at this location, respectively.

3.6.5 Summary and Conclusions

One constituent, benzene, exceeded NJDEP Soil Gas NRSs in near-slab soil gas at Parcel 34. No constituents were detected above the NJDEP Soil Gas NRS in sub-slab soil gas. Based on NJDEP VI guidance (12), further evaluation is required if constituents are detected above the NRS in near slab soil gas. Evaluation of indoor air in Bldg 2567 is recommended for Parcel 34.

**Table 3.6-2
Parcel 34 Sample and Analytical Summary**

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B/N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SG	CANISTER	34SG-1	12/13/07	13:40	3.0	3.0		X							
SG	CANISTER	34SG-2	12/13/07	12:10	5.0	5.0		X							
SG	CANISTER	34SG-3	12/13/07	12:50	5.0	5.0		X							
SG	CANISTER	34SG-3 DUPLICATE	12/13/07	13:00	5.0	5.0		X							

X = Sample analyzed for the indicated analytical parameter suite

Table 3.6-3
Fort Monmouth ECP Site Investigation, Parcel 34
Summary of Analytical Parameters Detected Soil Gas (ug/m³)

Chemical	Sample ID: Lab ID: Date Sampled: Depth (ft. bgs):	Analytical Results			
		34SG-1	34SG-2	34SG-3	34SG-3 DUP
		J79249-17	J79249-18	J79249-15	J79249-16
		12/13/07	12/13/07	12/13/07	12/13/07
	3'	5'	5'	5'	
SG Non-residential ²	Result	Result	Result	Result	
Volatiles					
Acetone	230,000	58.9	271	53.4	<3.3
Benzene	26	18	14	36.7	28
Carbon disulfide	51,000	<1.8	5.0	8.7 J	12 J
Cyclohexane	430,000	<2.4	<1.2	38.6	68.5
Ethanol	NLE	16	46.7	<5.5	<5.5
Ethylbenzene	74,000	241	186	1760	1500
n-Heptane	NLE	20	16	190	193
n-Hexane	51,000	33	27	298	479
Isopropyl Alcohol	NLE	<2.3	21	<2.9	<2.9
Methyl ethyl ketone	360,000	14	50.4	<2.2	<2.2
Propylene	NLE	<2.1	203	277	261
Styrene	73,000	<1.3	<0.64	24	20
Tertiary Butyl Alcohol	4,600	<2.2	<1.1	14	12 J
Tetrachloroethylene	36	20 J	22	<3.3	<3.3
Toluene	360,000	1590	1430	10700	9310
1,2,4-Trimethylbenzene	NLE	<1.6	5.9 J	15 J	12 J
2,2,4-Trimethylpentane	NLE	<1.5	<0.75	1540	3280
Xylenes (m&p)	NLE	791	621	6300	5170
o-Xylene	NLE	146	115	1210	999
Xylenes (total)	7,700	938	734	7510	6170

¹ NJDEP Generic Vapor Intrusion Screening Levels, Soil Gas Screening Levels, Residential, March 2007.

² NJDEP Generic Vapor Intrusion Screening Levels, Soil Gas Screening Levels, Nonresidential, March 2007. Results were compared

(a) = Sum of cis-1,2-Dichloroethylene and trans-1,2-Dichloroethylene.

J = Indicates an estimated value.

DUP = Duplicate Sample

NLE = No Limit Established

Bold = Detection

Shaded = Exceedance of SG Nonresidential.



LEGEND

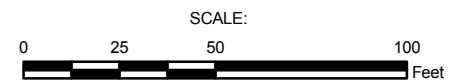
- * Soil-Gas Sample Location
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Building
- IRP Site Boundary
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

- 2 Areas where only release or disposal of petroleum products has occurred.

BRAC PARCEL LABEL DEFINITIONS

- 8(2)PS
- CONTAMINATION DESCRIPTION
- HS - Hazardous Substance Storage
 - HR - Hazardous Substance Release
 - PS - Petroleum Storage
 - PR - Petroleum Release
 - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER



Base Realignment and Closure 2005



Shaw Environmental, Inc.



FIGURE 3.6-1
FORT MONMOUTH ECP
SITE INVESTIGATION
PARCEL 34 SAMPLE LOCATIONS
AND CONSTITUENTS OF CONCERN
 CHARLES WOOD AREA
 FORT MONMOUTH
 NEW JERSEY

3.7 Parcel 38 – Former Outdoor Pistol Range (1940 - 1955)

3.7.1 Site Description

Parcel 38 is located in the northwestern portion of the MP, directly west of Bldg 200. The former Outdoor Firing Range was used from approximately 1940 through 1955. The small arms firing that occurred at the former Pistol Range (1935-1940 Pistol Range) directly west of Bldg 292 was relocated to this location around 1940 when the STP was constructed on the old range location. Range structures and the backstop berm at the former Outdoor Firing Range (1940-1955) have been removed/demolished. Munitions associated with the former Outdoor Firing Range are assumed to be small arms ammunition only; therefore, no MEC and limited MC are anticipated. The primary MC associated with small arms ranges is lead. Additional information pertaining to this parcel can be found in Section 4.3.4, Section 5.2.1.2, Section 5.2.2, and Section 5.10 of the Phase I ECP (1).

3.7.2 Previous Investigations

This site was originally included in the IRP as FTMM-21. Evidence of the former Outdoor Firing Range was uncovered during preparation of a preliminary assessment report. Because the location of the former range has been developed for over 40 years, the IRP recommendation was for NFA. This determination was approved by the NJDEP. An HRR was subsequently conducted at FTMM under the MMRP. Based on information discovered during the HRR, the correct location of the pistol Range was identified. Because the correct location is a manicured lawn adjacent to Bldg 1220, which may not have been heavily re-worked, the recommendation in the HRR was for further evaluation.

3.7.3 Site Investigation Sampling

The findings of the HRR (29) were reviewed to determine the location of the former berm and to establish a soil sampling grid. In order to evaluate the potential impact from previous pistol range operations in the area of the former berm, the following soil sampling was conducted at the former Outdoor Firing Range (29).

Surface Soil Investigation

Surface soil samples were collected in December 2007 in Parcel 38. A total of 25 surface soil samples (including one duplicate sample) were collected from 24 distinct hand augered borings located in the area of the former berm (**Figure 3.7-1**). Samples were taken in order to determine if any contamination exists from previous pistol range operations. Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. No visual or olfactory evidence of impacted soil was noted.

Table 3.7-1 presents a summary of all field activities, and all sample locations are provided on **Figure 3.7-1**. A summary of sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.7-2**.

Table 3.7-1
Parcel 38 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
38SS-A1 through 38SS-C8 (25 samples – includes 1 duplicate sample)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval (below topsoil) from a sample grid (conducted on 15-ft centers) to investigate the former pistol range berm.	TAL Metals

3.7.4 Site Investigation Results

Surface Soil Investigation Results

Surface soil samples were analyzed for TAL metals.

As shown in **Table 3.7-3**, a total of 18 metals were detected at Parcel 38; however, no metals were detected at concentrations above the NJDEP NRDCSCC or RDCSCC. No COCs were identified in soil at Parcel 38.

3.7.5 Summary and Conclusions

No constituents were identified above applicable NJDEP criteria. NFA is recommended for Parcel 38.

**Table 3.7-2
Parcel 38 Sample and Analytical Summary**

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B/N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	HAND AUGER	P38-SS1-A	12/21/07	9:00	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS2-A	12/21/07	9:10	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS3-A	12/21/07	9:20	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS4-A	12/21/07	9:30	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS5-A	12/21/07	9:40	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS6-A	12/21/07	9:50	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS7-A	12/21/07	10:00	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS8-A	12/21/07	10:10	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS1-B	12/21/07	10:20	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS2-B	12/21/07	10:30	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS3-B	12/21/07	10:40	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS4-B	12/21/07	10:50	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS4-B DUPLICATE	12/21/07	10:50	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS5-B	12/21/07	11:00	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS6-B	12/21/07	11:10	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS7-B	12/21/07	11:20	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS8-B	12/21/07	11:30	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS1-C	12/21/07	11:40	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS2-C	12/21/07	11:50	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS3-C	12/21/07	12:00	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS4-C	12/21/07	12:10	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS5-C	12/21/07	12:20	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS6-C	12/21/07	12:30	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS7-C	12/21/07	12:40	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS8-C	12/21/07	12:50	0.0	0.5					X				
BLANK	FIELD	FIELD BLANK	12/21/07	13:00	--	--					X				

X = Sample analyzed for the indicated analytical parameter suite

Table 3.7-3
Fort Monmouth Phase II Site Investigation, Parcel 38
Summary of Analytical Parameters Detected in Soil (mg/kg)

Chemical	Sample ID: Date Sampled: Depth (ft. bgs):		Analytical Results												
			P38SS-A1 7055601	P38SS-A2 7055602	P38SS-A3 7055603	P38SS-A4 7055604	P38SS-A5 7055605	P38SS-A6 7055606	P38SS-A7 7055607	P38SS-A8 7055608	P38SS-B1 7055609	P38SS-B2 7055610	P38SS-B3 7055611	P38SS-B4 7055612	P38SS-B4 DUP 7055625
			12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007
			0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Chemical	NRDCSCC ²	IGWSCC ³	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Metals															
Aluminum	NLE	NLE	13100 B	14800 B	14900 B	16300 B	12800 B	13500 B	12400 B	14300 B	19700 B	17900 B	15100 B	15800 B	16700 B
Arsenic	20	NLE	10.0	11.2	9.05	10.8	9.25	12.6	13.0	13.0	15.1	16.0	11.9	9.52	11.8
Barium	47,000	NLE	44.6 B	62.6 B	42.5 B	46.0 B	31.6 B	28.5 B	34.3 B	25.9 B	79.6 B	67.7 B	35.9 B	40.7 B	40.4 B
Beryllium	140	NLE	0.936	1.17	1.77	1.84	1.47	1.30	1.31	1.34	1.75	1.73	2.00	1.92	2.15
Cadmium	100	NLE	0.192	0.220	0.112	0.322	0.120	0.168	0.131	0.169	0.543	0.461	0.367	0.384	0.766
Calcium	NLE	NLE	417 B	602 B	1410 B	805 B	979 B	740 B	742 B	771 B	925 B	668 B	599 B	779 B	873 B
Chromium (Total)	NLE	NLE	80.8	102	141	151	124	108	103	117	175	157	160	154	171 B
Cobalt	NLE	NLE	0.525	1.03	1.24	1.76	1.40	1.58	1.69	1.35	1.83	1.19	1.29	1.32	1.71
Copper	45,000	NLE	18.2 B	23.5 B	13.2 B	12.3 B	9.78 B	8.55 B	12.2 B	12.0 B	34.0 B	23.8 B	11.6 B	12.4 B	13.2 B
Iron	NLE	NLE	31000	38000	52700 E	56500 E	46300 E	43300 E	41400	44200	63200 E	59900 E	64200 E	58200 E	62200 E
Lead	800	NLE	76.3	104	36.2	35.3	26.0	13.0	15.8	23.3	176	96.5	24.9	75.2	104
Magnesium	NLE	NLE	3380	4210	6590	6810	5390	4650	4260	4860	6860	6450	7090	7140	7780 B
Manganese	NLE	NLE	70.7 B	87.5 B	51.2 B	66.2 B	62.8 B	67.8 B	78.7 B	79.6 B	66.1 B	69.1 B	47.1 B	64.0 B	66.9 B
Mercury	270	NLE	0.32	0.62	0.116 U	0.115 U	0.114 U	0.103 U	0.113 U	0.109 U	0.137 U	0.110 U	0.101 U	0.121 U	0.104 U
Nickel (Soluble Salts)	2,400	NLE	11.4	14.8	12.1	10.7	8.67	8.57	8.56	8.17	62.4	22.7	9.97	10.7	12.4
Potassium	NLE	NLE	6170 B	7580 B	14000 B	14200 B	11500 B	9430 B	8420 B	9730 B	13100 B	12600 B	15600 B	15500 B	17200 B
Vanadium	7,100	NLE	102	129	100	98.0	77.5	71.5	69.3	73.8	715	273	109	95.9	107
Zinc	1,500	NLE	73.2 B	98.1 B	106 B	88.0 B	68.2 B	55.1 B	67.2 B	56.2 B	95.2 B	86.3 B	76.5 B	85.9 B	98.4 B

¹ NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

² NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

³ NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.

(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.7-3
Fort Monmouth Phase II Site Investigation, Parcel 38
Summary of Analytical Parameters Detected in Soil (mg/kg)

Chemical	Sample ID: Date Sampled: Depth (ft. bgs):		Analytical Results											
			P38SS-B5 7055613	P38SS-B6 7055614	P38SS-B7 7055615	P38SS-B8 7055616	P38SS-C1 7055617	P38SS-C2 7055618	P38SS-C3 7055619	P38SS-C4 7055620	P38SS-C5 7055621	P38SS-C6 7055622	P38SS-C7 7055623	P38SS-C8 7055624
			12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007
			0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Chemical	NRDCSCC ²	IGWSCC ³	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Metals														
Aluminum	NLE	NLE	13200 B	14800 B	15300 B	14200 B	10800 B	15000 B	15700 B	13100 B	9750 B	11600 B	13900 B	12700 B
Arsenic	20	NLE	10.2	11.0	11.3	12.9	8.65	9.75	9.70	9.53	9.65	8.61	11.9	12.2
Barium	47,000	NLE	32.7 B	42.5 B	52.9 B	46.9 B	42.6 B	36.1 B	48.3 B	35.5 B	24.6 B	42.2 B	30.9 B	31.9 B
Beryllium	140	NLE	1.07	1.18	1.19	1.14	1.45	1.96	2.04	1.65	0.895	0.988	1.35	1.23
Cadmium	100	NLE	0.131	0.141	0.299	0.291	0.524	0.417	0.620	0.479	0.299	0.551	0.410	0.583
Calcium	NLE	NLE	954 B	868 B	1090 B	1030 B	1620 B	422 B	829 B	764 B	899 B	1250 B	950 B	1010 B
Chromium	NLE	NLE	93.7	98.9	91.2	90.8	113 B	159 B	161 B	127 B	75.6 B	72.3 B	112 B	98.3 B
Cobalt	NLE	NLE	1.10	1.16	0.507	1.26	1.76	1.54	1.55	1.43	1.47	1.21	1.71	1.64
Copper	45,000	NLE	11.2 B	9.55 B	14.6 B	13.5 B	15.5 B	11.4 B	14.6 B	13.5 B	9.30 B	19.0 B	11.3 B	10.7 B
Iron	NLE	NLE	35700	38300	36500	36500	41500	57400 E	58100 E	49200 E	28200	29900	41900	37500
Lead	800	NLE	16.7	16.3	37.3	18.4	57.4	21.8	39.9	42.7	25.0	64.9	21.5	19.0
Magnesium	NLE	NLE	3880	4060	4050	3750	5110 B	6950 B	7340 B	6000 B	3050 B	3310 B	4780 B	4240 B
Manganese	NLE	NLE	79.0 B	87.2 B	128 B	85.4 B	63.0 B	49.1 B	59.1 B	58.0 B	64.4 B	114 B	77.4 B	73.5 B
Mercury	270	NLE	0.106 U	0.105 U	0.106 U	0.103 U	0.109 U	0.108 U	0.112 U	0.112 U	0.112 U	0.118 U	0.102 U	0.108 U
Nickel	2,400	NLE	8.53	8.66	9.47	11.6	16.8	9.33	13.5	10.8	7.67	8.62	9.54	9.22
Potassium	NLE	NLE	7980 B	8870 B	8280 B	8150 B	10600 B	15100 B	16000 B	13000 B	5980 B	6470 B	9910 B	8730 B
Vanadium	7,100	NLE	67.2	69.3	68.0	71.2	132	96.0	118	106	56.9	53.1	81.4	69.0
Zinc	1,500	NLE	57.9 B	52.6 B	76.7 B	63.0 B	91.6 B	80.5 B	103 B	75.1 B	51.3 B	93.1 B	68.7 B	72.4 B

¹ NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

² NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

³ NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

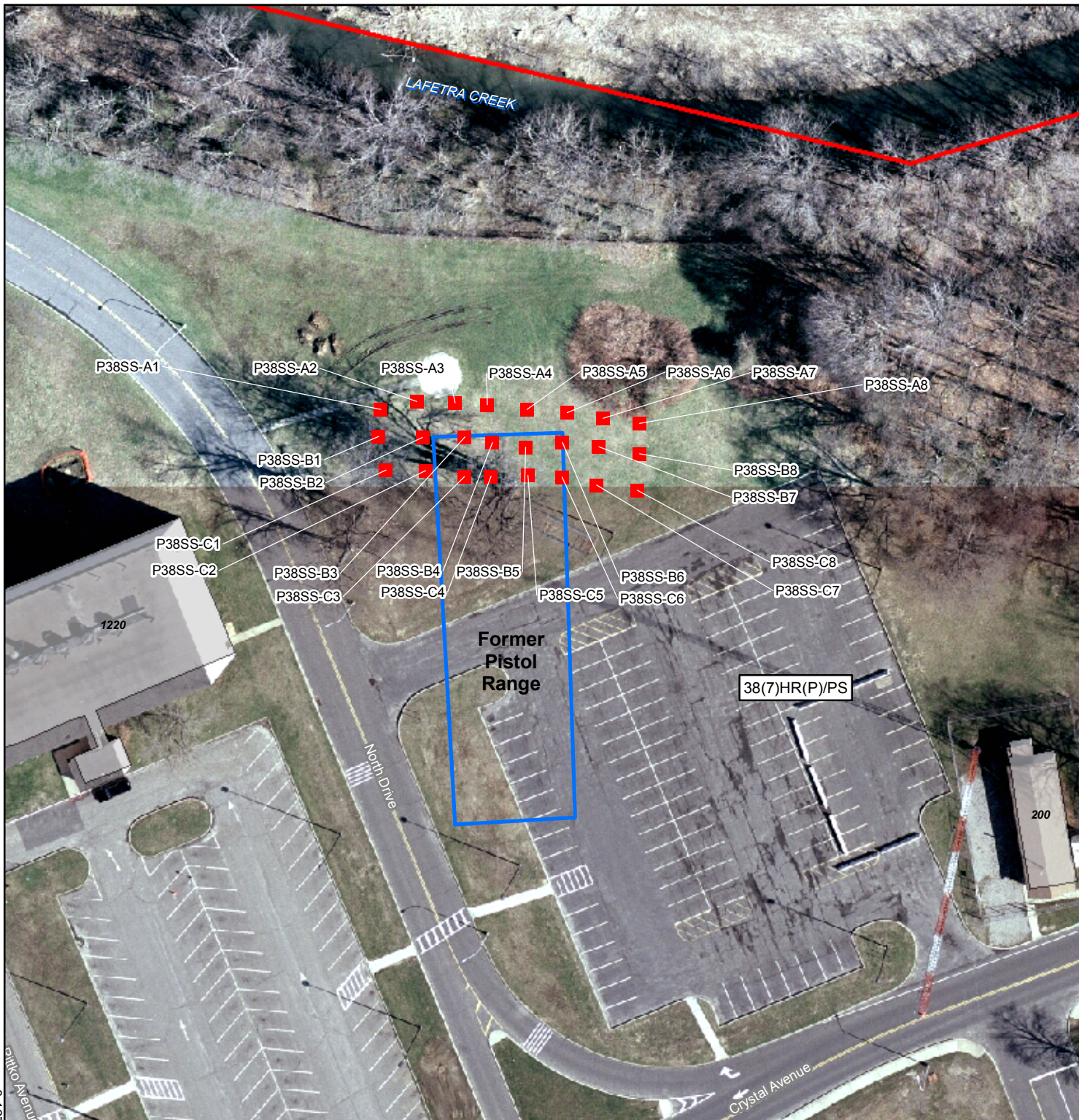
NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.

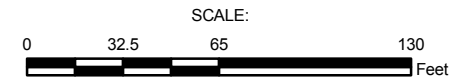
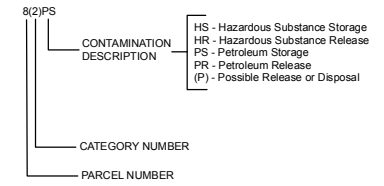
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).



LEGEND

- Surface Soil Sample Location
- Former Pistol Range
- Water Body
- Building
- Installation Boundary

BRAC PARCEL LABEL DEFINITIONS



Base Realignment and Closure 2005



Shaw Shaw Environmental, Inc.



FIGURE 3.7-1
FORT MONMOUTH ECP
SITE INVESTIGATION
PARCEL 38 SAMPLE LOCATIONS
 MAIN POST
 FORT MONMOUTH
 NEW JERSEY

3.8 Parcel 39 – Bldg 1150 (Vail Hall)

3.8.1 Site Description

Parcel 39 is located in the southwestern portion of the MP and encompasses the area between Bldg 1150 (Vail Hall) and Mill Creek. Bldg 1150 is utilized for administrative purposes. Within the basement is a large Uninterruptible Power Supply Room, emergency generator, floor drains, and a sump pump strictly for high water table events (discharges to basin behind building and ultimately to Mill Creek). Film developing activities formerly occurred in the basement of the building. Additional information pertaining to this parcel can be found in Section 4.3.2.1.5, Section 4.4.4.2, and Table 4-3 of the Phase I ECP (1).

3.8.2 Previous Investigations

The M-2 Landfill (Parcel 40) is located on the south bank of Mill Creek directly south of Parcel 39. Under the SI phase, surface water samples were collected from Mill Creek and surface water monitoring continues under the IRP within close proximity to Parcel 39.

3.8.3 Site Investigation Sampling

Surface water monitoring conducted in relation to Parcel 40 under the IRP adequately addresses the quality of surface water in proximity to Parcel 39. Surface soil and sediment sampling was conducted to determine the impact of Bldg 1150 operations on soil and sediment at potential discharge locations from Bldg 1150 along Mill Creek.

Surface Soil Investigation

A surface soil sample was collected in December 2007 in Parcel 39 from one distinct hand augered boring located at an outfall on the north bank of Mill Creek adjacent to Bldg 1150 (**Figure 3.8-1**). The outfall is the end of a underground terracotta pipe that leads from the direction of Bldg 1150. It was identified during a 2007 site walk as a potential historic discharge location from Bldg 1150 based on the orientation in which it appears to extend underground (towards Bldg 1150). A sample was collected in order to determine if any contamination exists from potential historic discharges from Bldg 1150. The surface soil sample for non-VO analysis was collected from the 0- to 6-inch interval bgs, and the soil sample for VO analysis was collected from the 18- to 24-inch bgs interval. No visual or olfactory evidence of soil contamination was noted.

Sediment Investigation

Sediment samples were collected in January 2008 in Parcel 39. A total of four sediment samples were collected from two distinct hand augered borings located along the north bank of Mill Creek adjacent to Bldg 1150 (**Figure 3.8-1**). Samples were collected from deposition locations immediately downgradient of the drainage basin located immediately behind Bldg 1150 in order to determine if contamination exists from potential historic discharges from Bldg 1150. Sediment samples for non-VO and VO

analysis were collected from the 0- to 6-inch interval bgs and the 18- to 24-inch interval bgs, respectively. No visual or olfactory evidence of impacted sediment was noted.

Table 3.8-1 presents a summary of all field activities, and all sample locations are provided on **Figure 3.8-1**. An analytical summary of sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.8-2**.

Table 3.8-1
Parcel 39 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
39SD-1 and 2 (2 samples)	Sediment	Sediment samples were collected from the 0- to 6-inch bgs interval to investigate potential discharges from Bldg 1150. Samples were located at the closest point in the creek from the drainage basin located across the parking area at the rear of the building and at the downstream stormwater outfall.	TCL+30 (w/o pesticides), TAL Metals
39SD-1D and 2D (2 samples)	Sediment	Sediment samples were collected from the 18- to 24-inch interval bgs to investigate potential historic discharges from Bldg 1150.	TCL+30 (w/o pesticides), TAL Metals
39SS-1 (1 sample)	Surface soil	A soil sample was collected from the 0- to 6-inch bgs interval to investigate potential discharges from Bldg 1150. The sample was located at the outfall of a clay pipe leading from the direction of Bldg 1150.	TCL+30 (w/o pesticides), TAL Metals

3.8.4 Site Investigation Results

Soil Investigation Results

The surface soil sample collected at Parcel 39 was analyzed for TCL+30 (minus pesticides) and TAL metals.

As presented in **Table 3.8-3**, four B/Ns were detected at concentrations below NJDEP NRDCSCC. A total of 18 metals were detected; however, all metals were detected at concentrations below NJDEP NRDCSCC.

Sediment Investigation Results

Sediment samples were analyzed for TCL+30 (without pesticides) and TAL metals. Mill Creek is a non-tidal water body in this portion of the facility; therefore, sediment analytical results were evaluated in relation to the Freshwater Sediment Screening Values-LEL.

As summarized in **Table 3.8-4**, a total of nine B/Ns and 18 metals were detected in Parcel 39 sediment samples. Of the nine B/Ns detected, six (benzo[a]anthracene, benzo[a]pyrene, chrysene, fluoranthene, phenanthrene, and pyrene) were detected at

concentrations that exceeded Freshwater Sediment Screening Values-LEL. Many of these concentrations also exceeded their respective Main Post Background Concentration (MPBC). No B/Ns were detected above the SEL.

Benzo(a)anthracene was detected above the LEL of 0.320 mg/kg in one sediment sample (P39-SD2) collected in Parcel 39 at a concentration of 0.540 mg/kg. Benzo(a)anthracene concentrations did not exceed the MPBC of 1.3 mg/kg.

Benzo(a)pyrene was detected above the LEL of 0.370 mg/kg and the MPBC of 1.2 mg/kg in one sediment sample (P39-SD1D) at a concentration of 1.400 mg/kg.

Chrysene was detected above the LEL of 0.340 mg/kg in two sediment samples collected in Parcel 39 at concentrations of 0.370 mg/kg (P39-SD1) and 0.710 mg/kg (P39-SD2). These two chrysene concentrations were equal to or exceeded the MPBC of 0.370 mg/kg.

Fluoranthene was detected above the LEL of 0.750 mg/kg in one sediment sample (P39-SD2) at a concentration of 0.990 mg/kg. Fluoranthene concentrations did not exceed the MPBC of 1.5 mg/kg.

Phenanthrene was detected above the LEL of 0.560 mg/kg and the MPBC of 0.39 mg/kg in one sediment sample (P39-SD2) at a concentration of 0.670 mg/kg.

Pyrene was detected above the LEL of 0.490 mg/kg in three sediment samples collected in Parcel 39 at concentrations ranging from 1.000 mg/kg (P39-SD1) to 2.000 mg/kg (P39-SD2). Pyrene concentrations did not exceed the MPBC of 2.00 mg/kg.

Of the 18 metals detected, eight (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc) were detected at concentrations that exceeded the LEL. Only one metal, chromium, was detected in sediment at Parcel 39 marginally above the SEL.

Arsenic was detected above the LEL of 6 mg/kg in two sediment samples collected in Parcel 39 at concentrations of 6.21 mg/kg (sample P39SD-1D) and 8.89 mg/kg (sample P39SD-2). Arsenic concentrations did not exceed the MPBC of 14.5 mg/kg.

Cadmium was detected above the LEL of 0.6 mg/kg in three sediment samples collected in Parcel 39 at concentrations ranging from 0.629 mg/kg in sample P39SD-1 to 1.85 mg/kg in sample P39SD-2. No background concentration has been established for cadmium.

Chromium was detected above the LEL of 26 mg/kg in all four sediment samples collected in Parcel 39 at concentrations ranging from 44.2 mg/kg in sample P39SD-1 to 131 mg/kg in sample P39SD-2. The SEL of 110 mg/kg for chromium was exceeded at concentrations of 113 mg/kg and 131 mg/kg in samples P39-SD1D and P39-SD2, respectively. Three of the four chromium concentrations also exceeded the MPBC of 88.1 mg/kg.

Copper was detected above the LEL of 16 mg/kg in three sediment samples ranging from concentrations of 27.7 mg/kg (sample P39SD-1) to 41.0 mg/kg (sample P39SD-2). Copper concentrations did not exceed the MPBC of 48.4 mg/kg.

Lead was detected above the LEL of 31 mg/kg in two sediment samples collected in Parcel 39 at concentrations of 61.7 mg/kg in sample P39SD-2 and 69.0 mg/kg in sample P39SD-2D. The lead concentration detected in sample P39SD-2D also exceeded the MPBC of 64.1 mg/kg.

Mercury was detected above the LEL of 0.2 mg/kg in two sediment samples collected in Parcel 39 at concentrations of 0.67 mg/kg in sample P39SD-2 and 0.59 mg/kg in sample P39SD-2D. Mercury concentrations did not exceed the MPBC of 1.7 mg/kg.

Nickel was detected above the LEL of 16 mg/kg in two sediment samples collected in Parcel 39 at concentrations of 32.4 mg/kg in sample P39SD-2 and 23.0 mg/kg in sample P39SD-2D. Nickel concentrations did not exceed the MPBC of 131 mg/kg.

Zinc was detected above the LEL of 120 mg/kg and the MPBC of 162 mg/kg in two sediment samples collected in Parcel 39 at concentrations of 210 mg/kg in sample P39SD-2 and 204 mg/kg in sample P39SD-2D.

Since benzo(a)pyrene, chrysene, phenanthrene, cadmium, chromium, lead, and zinc concentrations exceeded the LEL and the MPBC, these compounds are considered COCs in sediment at Parcel 39.

3.8.5 Summary and Conclusions

No constituents were identified above applicable NJDEP criteria in surface soil. NFA is recommended for soil within Parcel 39.

Three B/Ns (benzo[a]pyrene, chrysene, and phenanthrene) and four metals (cadmium, chromium, lead, and zinc) were detected in sediment at concentrations greater than the Freshwater Sediment Screening Values-LEL and MPBC. The three B/Ns and four metals are identified as COCs. Chromium was the only compound detected in excess of the Freshwater Sediment Screening Values-SEL. Sediment at Parcel 39 is recommended for further evaluation as part of a facility-wide baseline ecological evaluation.

**Table 3.8-2
Parcel 39 Sample and Analytical Summary**

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B/N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
BLANK	TRIP	TRIP BLANK-SO	12/20/07	8:30	NA	NA									Cancelled by lab. Recollected 01/08/08.
BLANK	FIELD	FIELD BLANK-SO	12/20/07	16:50	NA	NA									Cancelled by lab. Recollected 01/08/08.
SD	HAND AUGER	P39-SD1	12/20/07	9:00	0	0.5									Cancelled by lab. Recollected 01/08/08.
SD	HAND AUGER	P39-SD1D	12/20/07	9:10	1	1.5									Cancelled by lab. Recollected 01/08/08.
SD	HAND AUGER	P39-SD2	12/20/07	9:40	0	0.5									Cancelled by lab. Recollected 01/08/08.
SD	HAND AUGER	P39-SD2D	12/20/07	9:50	1	1.5									Cancelled by lab. Recollected 01/08/08.
SOIL	HAND AUGER	P39-SS1	12/20/07	10:20	0	0.5									Cancelled by lab. Recollected 01/08/08.
SOIL	HAND AUGER	P39SS-1	12/27/07	11:39	1.5	2		X							Associated trip blank collected with Parcel 27. No field blank or duplicate collected 12/27/07.
SOIL	HAND AUGER	P39-SS1	01/08/08	14:10	0	0.5		X	X	X	X				VOCs not needed. They were collected at correct depth on 12/27. Associated field and trip blanks collected with Parcel 27.
SD	HAND AUGER	P39-SD1	01/08/08	13:10	0.0	0.5		X	X	X	X				Associated field and trip blanks collected with Parcel 27.
SD	HAND AUGER	P39-SD1D	01/08/08	13:25	1.0	1.5		X	X	X	X				Associated field and trip blanks collected with Parcel 27.
SD	HAND AUGER	P39-SD2	01/08/08	13:40	0.0	0.5		X	X	X	X				Associated field and trip blanks collected with Parcel 27.
SD	HAND AUGER	P39-SD2D	01/08/08	13:55	1.0	1.5		X	X	X	X				Associated field and trip blanks collected with Parcel 27.

X = Sample analyzed for the indicated analytical parameter suite

Table 3.8-3
Fort Monmouth Phase II Site Investigation, Parcel 39
Summary of Analytical Parameters Detected in Soil (mg/kg)

Chemical	Sample ID: Lab ID: Date Sampled: Depth (ft. bgs):		Analytical Results
			Result
	NRDCSCC ²	IGWSCC ³	
Semi-Volatiles			
bis(2-Ethylhexyl)phthalate	210	100	0.570 J
Di-n-butylphthalate	10000	100	0.780 J
Fluoranthene	10000	100	0.120 J
Pyrene	10000	100	0.290 J
Metals			
Aluminum	NLE	NLE	7450 B
Arsenic	20	NLE	3.43
Barium	47000	NLE	50.6 B
Beryllium	140	NLE	1.78
Cadmium	100	NLE	1.56
Calcium	NLE	NLE	1480 B
Chromium (Total)	NLE	NLE	94.0
Cobalt	NLE	NLE	31.9
Copper	45000	NLE	27.7 B
Iron	NLE	NLE	26400
Lead	800	NLE	80.0
Magnesium	NLE	NLE	3000
Manganese	NLE	NLE	15.9
Mercury	270	NLE	0.21
Nickel (Soluble Salts)	2400	NLE	22.1
Potassium	NLE	NLE	7170
Vanadium	7100	NLE	41.8
Zinc	1500	NLE	140 B

¹ NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

² NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

³ NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.

(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.8-4
Fort Monmouth Phase II Site Investigation, Parcel 39
Summary of Analytical Parameters Detected in Sediment (mg/kg)

Chemical	Sample ID: Lab ID: Date Sampled: Depth (ft. bgs):		Analytical Results			
			P39-SD1	P39-SD1D	P39-SD2	P39-SD2D
			8000801	8000802	8000803	8000804
			01/08/2008	01/08/2008	01/08/2008	01/08/2008
Chemical	Depth (ft. bgs):		0.0-0.5	1.0-1.5	0.0-0.5	1.0-1.5
	LEL ¹	SEL ²	Result	Result	Result	Result
Semi-Volatiles						
Benzo[a]anthracene	0.320	1480	0.260 J	1.300 U	0.540 J	1.600 U
Benzo[a]pyrene	0.370	1440	1.300 U	1.400	2.100 U	1.600 U
Benzo[b]fluoranthene	NLE	NLE	1.300 U	1.300 U	1.100 J	1.600 U
bis(2-Ethylhexyl)phthalate	NLE	NLE	2.100	1.300 U	1.300 J	2.900
Chrysene	0.340	460	0.370 J	1.300 U	0.710 J	1.600 U
Di-n-butylphthalate	NLE	NLE	0.950 J	2.100	1.900 J	1.000 J
Fluoranthene	0.750	1020	0.440 J	0.180 J	0.990 J	0.550 J
Phenanthrene	0.560	950	0.260 J	0.180 J	0.670 J	0.390 J
Pyrene	0.490	850	1.000 J	0.380 J	2.000 J	1.200 J
Metals						
Aluminum	NLE	NLE	4710 B	11900 B	13900 B	9510 B
Arsenic	6	33	2.28	6.21	8.89	5.56
Barium	NLE	NLE	26.8 B	40.6 B	96.4 B	73.5 B
Beryllium	NLE	NLE	0.638	1.58	3.34	2.11
Cadmium	0.6	10	0.629	0.432	1.85	1.49
Calcium	NLE	NLE	3150 B	2550 B	2390 B	3600 B
Chromium (Total)	26	110	44.2	113	131	89.1
Cobalt	NLE	NLE	3.92	1.86	14.2	11.7
Copper	16	110	27.7 B	12.5 B	41.0 B	30.9 B
Iron	NLE	NLE	17200	40200	45600	30000
Lead	31	250	19.5	7.58	61.7	69.0
Magnesium	NLE	NLE	2720	5020	3910	3020
Manganese	NLE	NLE	49.6	61.0	68.4	38.5
Mercury	0.2	2	0.120 U	0.129 U	0.67	0.59
Nickel (Soluble Salts)	16	75	11.6	8.16	32.4	23.0
Potassium	NLE	NLE	3150	10300	7870	3040
Vanadium	NLE	NLE	31.1	60.0	74.4	53.0
Zinc	120	820	100 B	66.6 B	210 B	204 B

¹ NJDEP Freshwater Sediment Screening Values - Lowest Effect Levels, 1998.

² NJDEP Freshwater Sediment Screening Guidelines - Severe Effects Levels, 1998.

For non-polar organics (PAHs, organochlorine pesticides, PCBs), the SEL is calculated from a site-specific TOC level. To calculate a site-specific SEL, TOC is multiplied by the table SEL. However, no TOC analysis was performed on the FTMM sediment samples. Generally, TOC values range from 1% (10,000 mg/kg) to 10% (100,000 mg/kg) (USEPA, 1998). Since the table SEL is based on 100% TOC, the calculated site-specific SEL would be lower.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte detected.

Shaded = Concentration exceeds LEL.

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P39SD-2	SD	0.0-0.5	Chrysene	0.710 J	LEL/SEL	0.340/460
P39SD-2	SD	0.0-0.5	Phenanthrene	0.670 J	LEL/SEL	0.560/950
P39SD-2	SD	0.0-0.5	Cadmium	1.85	LEL/SEL	0.6/10
P39SD-2	SD	0.0-0.5	Chromium	131	LEL/SEL	26/110
P39SD-2	SD	0.0-0.5	Zinc	210 B	LEL/SEL	120/820
P39SD-2D	SD	1.0-1.5	Cadmium	1.49	LEL/SEL	0.6/10
P39SD-2D	SD	1.0-1.5	Chromium	89.1	LEL/SEL	26/110
P39SD-2D	SD	1.0-1.5	Lead	69.0	LEL/SEL	31/250
P39SD-2D	SD	1.0-1.5	Zinc	204 B	LEL/SEL	120/820



Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P39SD-1	SD	0.0-0.5	Cadmium	0.629	LEL/SEL	0.6/10
P39SD-1D	SD	1.0-1.5	Benzo[a]pyrene	1.400	LEL/SEL	0.370/1440
P39SD-1D	SD	1.0-1.5	Chromium	113	LEL/SEL	26/110

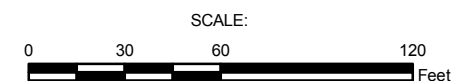
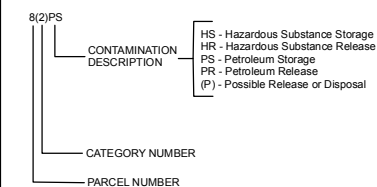
LEGEND

- Surface Soil Sample Location
- ▲ Sediment Sample Location
- Building
- IRP Site Boundary
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

- 7 Areas that are not evaluated or require additional evaluation.

BRAC PARCEL LABEL DEFINITIONS



Base Realignment and Closure 2005



FIGURE 3.8-1
FORT MONMOUTH ECP
SITE INVESTIGATION
PARCEL 39 SAMPLE LOCATIONS
AND CONSTITUENTS OF CONCERN
MAIN POST
FORT MONMOUTH
NEW JERSEY

3.9 Parcel 43 – Bldg 1122 (Do-It-Yourself Auto Repair)

3.9.1 Site Description

Bldg 1122 is located on the MP and houses a modern “do-it-yourself” vehicle repair shop. Bldg 1122 is a one-story building built on a slab and is approximately 11,600 square feet in size. Furniture paint stripping was reported in the Woodworking Craft Shop section of Bldg 1122 in 1973 (30).

Currently, all vehicle repairs are done by FTMM personnel and are performed inside the building. Degreasing solvents are used and generate hazardous waste from these operations (31). Pneumatic lifts are present. The 2006 Stormwater Pollution Prevention Plan states, “Floor drains located near the pneumatic lifts, have been closed off.” Used oil is collected in a 55-gallon drum stored inside the shop. When filled, the contents are pumped into a 995-gallon double-walled aboveground storage tank (AST) located between the repair shop and the car wash (Bldg 1124).

Floor drains in the bays and satellite accumulation room were noted during the 2006 VSI. The floors drains, previously connected to the car wash facility in Bldg 1124, were sealed off in June 2007. The enclosed car wash facility is located to the east of the repair shop. All wash water is recycled and reused and an active oil/water separator is in place (33). A 1993 renovation plan, which details the replacement of the floor drains, shows that the drains were connected to the sanitary sewer system (32). A former oil/water separator was associated with this building. Additional information pertaining to this parcel can be found in Section 4.3.2.1.2, Section 4.4.3.2, Section 5.1.1.2.1, Section 5.1.7.1, and Table 5-5 of the Phase I ECP (1).

3.9.2 Previous Investigations

Bldg 1122 has been investigated under the FTMM IRP as Site FTMM-59. There have been two USTs removed from the Bldg 1122 area. The DPW removed one UST located west of Bldg 1122 in June 1994. The UST was a 1,500-gallon single-walled steel tank used for storing # 2 fuel oil. During tank closure activities, a petroleum discharge to site soil and groundwater was identified. In accordance with NJDEP UST Site Assessment activity requirements, all petroleum contaminated soils have been removed and disposed. In addition, the DPW installed two monitoring wells to determine any adverse impact to groundwater.

The DPW removed a 550-gallon waste oil UST from beneath the pavement north of the building. During the UST removal, the subsurface evaluator did not identify any holes in the tank and did not observe any potentially contaminated soil. Following soil excavation and soil removal, five post-excavation samples were collected and analyzed for TPHC and organic and inorganic TCL compounds plus 40 TICs. TPHC was detected below the NJDEP criteria of 10,000 mg/kg.

The area of the former waste oil tank removal was the focus of an RI performed in 2005. PCE was initially detected at levels above NJDEP GWQC. PCE concentrations may be attributable to the former 550-gallon single wall steel waste oil UST removed from the

site on January 6, 1992. However, according to the UST Closure and SI Report, all post-excavation sample results were below the proposed New Jersey Department of Environmental Protection and Energy subsurface cleanup criteria (46). PCE was not detected in any of the post-excavation samples which were analyzed for TPHC and PP+40. The UST Closure Report was submitted to NJDEP on February 26, 1996. Subsequent to the 2005 RI, consecutive quarterly rounds of groundwater samples were collected for analysis. Surface water sampling points (Mill Creek) currently exist downgradient from the site and are being monitored. PCE continues to be quantified in one of the two site monitoring wells above NJDEP GWQC.

Also reported in the 2005 RI report, a Geoprobe® Investigation was performed in April 2004 to further evaluate site soil and groundwater conditions and potential contaminant migration under the FTMM IRP. The investigation determined there was a release of # 2 fuel oil to the site. The investigation to determine the extent of the petroleum contamination concluded that the extent of the release was localized. A well sump was installed for the removal of free-phase product. No free-phase product has been observed. An RI report summarizing these findings was submitted to the NJDEP in October 2005. To date, no response has been received from the NJDEP.

Currently, as part of the monitoring program for this IRP site, five groundwater monitoring wells are sampled on a quarterly basis. The cleanup strategy is to continue compliance monitoring of surface water and five groundwater monitoring wells as a key component of monitored natural attenuation. Due to the target date of 2011 for installation closure under the 2005 BRAC program, the cleanup strategy was re-evaluated. The current cleanup strategy includes 2 years of HRC injections to enhance monitored natural attenuation. Injection of HRC is subject to requirements pursuant to N.J.A.C. 7:26E-4.1(a)4 and N.J.A.C. 7:26E-6.3(c) related to the performance of a pilot study and approval of a permit-by-rule. HRC will be injected into a localized area in 2008 and 2009. Site closeout is anticipated to occur in 2011.

3.9.3 Site Investigation Sampling

As discussed in **Section 3.9.2**, Bldg 1122 has been extensively investigated under the FTMM IRP. The IRP is addressing all issues associated with former USTs and groundwater contamination. However, no evaluations of potential impact to sediment in Mill Creek or VI pathways have been conducted. A review of stormwater management plans and historical documents was conducted to evaluate potential discharge locations. Sediment sampling locations were then selected to evaluate the potential impact of previous Bldg 1122 activities on sediment located within Mill Creek. Historic groundwater monitoring data was screened to determine if a VI investigation is warranted.

Sediment Investigation

Sediment samples were collected in December 2007 in Parcel 43. The methodology followed during sediment sampling is presented in **Section 2.1**. A total of six sediment samples were collected from three distinct locations in Mill Creek adjacent to Bldg 1122.

Two samples were collected from each location; one from the 0- to 6-inch interval below the creek, and another from the 12- to 18-inch interval, measured from the bottom of the creek.

Vapor Intrusion Investigation

Through previous investigations conducted under the IRP, groundwater VO contamination has been identified in close proximity to Bldg 1122. Per NJDEP guidance and consistent with USEPA policy, the NJDEP recommends investigation of VI where structures are within 100 ft horizontally or vertically of shallow groundwater contamination in excess of GWSLs (12). PCE is the sole contaminant detected above the GWSLs within 100 ft of Bldg 1122, and no degradation products have been observed. Therefore, VI at Bldg 1122 was further evaluated through the collection of near-slab soil gas samples, sub-slab soil gas samples, and indoor air samples.

Table 3.9-1 presents a summary of all field activities, and sample locations are provided on **Figure 3.9-1**. An analytical summary of the sediment sampling, soil gas and indoor air sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.9-2**.

Table 3.9-1
Parcel 43 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
43SD-1, 2, and 3 (3 samples)	Sediment	Sediment samples were collected from the 0- to 6-inch bgs interval to investigate potential historic discharges to Mill Creek from Bldg 1122.	TCL+30 (w/o pesticides), TAL Metals
43SD-1D, 2D, and 3D (3 samples)	Sediment	Sediment samples were collected from the 6-inch interval from 12 to 18 inches bgs to investigate potential historic discharges from Bldg 1122.	TCL+30 (w/o pesticides), TAL Metals
43SG-1 and 2 (3 samples – includes 1 duplicate sample)	Near-slab soil gas	Two near-slab soil gas samples were collected at Bldg 1122. Groundwater flow direction is to the northwest, and PCE has been detected above GWSLs north and northeast of the building. Therefore, the sample locations were biased to the northeast corner of the building.	NJDEP – SRWM Low Level USEPA TO-15 Method
43SG-3 and 4 (2 samples)	Sub-slab soil gas	Two sub-slab soil gas samples were collected from the northeast portion of Bldg 1122 (Autocraft). Because this is a facility utilized for auto repair, sub-slab soil gas was selected for analysis in lieu of indoor air.	NJDEP – SRWM Low Level USEPA TO-15 Method

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
43IA-1 (1 sample)	Indoor air	One indoor air sample was collected from within Bldg 1122 in the southwest portion of the facility (Arts and Crafts). One ambient air sample was collected from outside the building.	NJDEP – SRWM Low Level USEPA TO-15 Method

3.9.4 Site Investigation Results

Sediment Investigation Results

Sediment samples were analyzed for TCL+30 (without pesticides) and TAL metals. Mill Creek is a tidally influenced water body in this portion of the facility; therefore, sediment analytical results were evaluated in relation to the Marine/Estuarine Sediment Screening Values-ER-L.

As shown in **Table 3.9-3**, two VOs and 11 B/Ns were detected in the sediment samples. VO concentrations were below ER-L values. Of the 11 B/Ns detected, eight B/Ns were detected at concentrations in excess of the ER-L. Some B/Ns were also detected above the MPBC. No B/Ns were detected above the ER-M.

Anthracene was detected above the ER-L of 0.085 mg/kg and the MPBC of 0.061 mg/kg in one sediment sample (P43-SD1) at a concentration of 0.150 mg/kg.

Benzo(a)anthracene was detected above the ER-L of 0.261 mg/kg in two sediment samples collected at Parcel 43 at concentrations of 0.610 mg/kg (P43-SD1) and 0.510 mg/kg (P43-SD3). The benzo(a)anthracene concentrations were below the MPBC of 1.3 mg/kg.

Benzo(a)pyrene was detected above the ER-L of 0.430 mg/kg in two sediment samples collected at Parcel 43 at concentrations of 0.610 mg/kg (P43-SD1) and 0.510 mg/kg (P43-SD3). The benzo(a)pyrene concentrations were below the MPBC of 1.2 mg/kg.

Benzo(k)fluoranthene was detected above the ER-L of 0.240 mg/kg in two sediment samples collected at Parcel 43 at concentrations of 0.340 mg/kg (P43-SD1) and 0.390 mg/kg (P43-SD3). The benzo(k)fluoranthene concentrations were below the MPBC of 0.58 mg/kg.

Chrysene was detected above the ER-L of 0.384 mg/kg and the MPBC of 0.370 mg/kg in two sediment samples collected in Parcel 43 at concentrations of 0.860 mg/kg (P43-SD1) and 0.880 mg/kg (P43-SD3).

Fluoranthene was detected above the ER-L of 0.600 mg/kg in two sediment samples collected at Parcel 43 at concentrations of 1.400 mg/kg (P43-SD1) and 1.300 mg/kg (P43-SD3). The fluoranthene concentrations were below the MPBC of 1.5 mg/kg.

Phenanthrene was detected above the ER-L of 0.240 mg/kg and the MPBC of 0.39 mg/kg in three sediment samples at concentrations ranging from 0.280 mg/kg (P43-SD1D) to 0.700 mg/kg (P43-SD1).

Pyrene was detected above the ER-L of 0.665 mg/kg in two sediment samples collected at Parcel 43 at concentrations of 1.400 mg/kg (P43-SD3) and 1.600 mg/kg (P43-SD1). The pyrene concentrations were below the MPBC of 2.0 mg/kg.

A total of 18 metals were detected in Parcel 43 sediment samples. Eight metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc) were detected at concentrations that exceed the ER-L. No metals were detected in excess of the ER-M.

Arsenic was detected above the ER-L of 8.2 mg/kg in one sediment sample collected in Parcel 43 at a concentration of 10.2 mg/kg (sample P43-SD2). Arsenic concentrations were below the MPBC of 14.5 mg/kg.

Cadmium was detected above the ER-L of 1.2 mg/kg in four sediment samples collected in Parcel 43 at concentrations ranging from 1.34 mg/kg in sample P43-SD1D to 1.86 mg/kg in sample P43-SD1. The cadmium concentrations could not be compared to background levels because no background concentration has been established for cadmium.

Chromium was detected above the ER-L of 81 mg/kg and the MPBC of 88.1 mg/kg in five sediment samples collected in Parcel 43 at concentrations ranging from 125 mg/kg in sample P43-SD1D to 473 mg/kg in sample P43-SD3D.

Copper was detected above the ER-L of 34 mg/kg in two sediment samples collected in Parcel 43 at concentrations of 39.4 mg/kg in sample P43-SD1 and 53.6 mg/kg in sample P43-SD2 (**Table 3.9-3**). The copper concentration detected in sample P43-SD2 also exceeded the MPBC of 48.4 mg/kg.

Lead was detected above the ER-L of 47 mg/kg in three sediment samples collected in Parcel 43 at concentrations ranging from 58.8 mg/kg in sample P43-SD1D to 116 mg/kg in sample P43-SD2. Lead concentrations also exceeded the MPBC of 64.1 mg/kg in two samples.

Mercury was detected above the ER-L of 0.15 mg/kg in five sediment samples collected in Parcel 43 at concentrations ranging from 0.25 mg/kg in sample P43-SD2 to 0.47 mg/kg in sample P43-SD1. Mercury concentrations were below the MPBC of 1.7 mg/kg.

Nickel was detected above the ER-L of 21 mg/kg in five sediment samples collected in Parcel 43 at concentrations ranging from 23.7 mg/kg in sample P43-SD3 to 36.4 mg/kg in sample P43-SD1. Nickel concentrations were below the MPBC of 131 mg/kg.

Zinc was detected above the ER-L of 150 mg/kg in four sediment samples collected in Parcel 43 at concentrations ranging from 157 mg/kg in sample P43-SD2D to 286 mg/kg

in sample P43-SD1. Zinc concentrations exceeded the MPBC of 162 mg/kg in three samples.

Since anthracene, chrysene, phenanthrene, cadmium, chromium, copper, lead, and zinc concentrations exceeded the ER-L and the MPBC, these constituents are identified as COCs in sediment at Parcel 43.

Vapor Intrusion Investigation Results

Soil gas and indoor air samples were analyzed for VOs by USEPA Method TO-15.

A total of 21 VOs were detected in soil gas samples collected in Parcel 43. Of the 21 VOs detected, two (PCE and TCE) exceeded NJDEP Soil Gas NRSs for soil gas. As presented in **Table 3.9-4**, PCE was detected in all five soil gas samples (including one duplicate) at concentrations ranging from 78.7 $\mu\text{g}/\text{m}^3$ in sample 43SG-2 to 285 $\mu\text{g}/\text{m}^3$ in sample 43SG-3. TCE was detected in three of the five soil gas samples at concentrations ranging from 44 $\mu\text{g}/\text{m}^3$ in sample 43SG-3 to 1,130 $\mu\text{g}/\text{m}^3$ in sample 43SG-1.

A total of 25 VOs were detected in the indoor air sample collected in Parcel 43. Of the 25 VOs detected, two (benzene and dichloromethane) exceeded NJDEP Indoor Air NRSs for indoor air samples. No constituents were detected above the Rapid Action Levels for indoor air. Results are presented in **Table 3.9-5**. Neither benzene nor dichloromethane were detected above screening criteria in soil gas and were not detected above the GWSLs in groundwater; therefore, the detections of these constituents in indoor air are likely attributable to current activities within the building and not from contamination in groundwater proximal to Bldg 1122. Further, a strong aroma indicative of the recent use of spray paint was evident in the immediate area of the indoor air sample canister upon entry into the Craft Shop during sample retrieval. TCE and PCE (the only constituents identified above the Soil Gas NRSs in soil gas proximal to Bldg 1122) were not detected in indoor air within Bldg 1122.

3.9.5 Summary and Conclusions

Three B/Ns (anthracene, chrysene, and phenanthrene) and five metals (cadmium, chromium, copper, lead, and zinc) were detected in sediment at concentrations greater than the Marine/Estuarine Sediment Screening Values-ER-L and their respective MPBC. As a result, these compounds are considered COCs. Sediments at Parcel 43 are recommended for further evaluation as part of a facility-wide baseline ecological evaluation.

PCE and TCE exceeded NJDEP Soil Gas NRSs in soil gas collected at Parcel 43, but were not detected in indoor air within Bldg 1122. Benzene and dichloromethane were detected at concentrations greater than the NJDEP Indoor Air NRSs in indoor air at Bldg 1122. Benzene and dichloromethane detections in indoor air are likely attributable to activities within the building and the use of products that contain these constituents. Based on NJDEP VI guidance (12), a second round of indoor air sampling is

recommended. One additional round of indoor air sampling is recommended to confirm constituents associated with groundwater are not present above criteria for indoor air at Bldg 1122. One additional indoor air sample should be collected in the northeastern corner of the building, coinciding with the location at which PCE and TCE were detected in soil gas.

**Table 3.9-2
Parcel 43 Sample and Analytical Summary**

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SD	HAND AUGER	P43-SD1	12/19/07	14:15	0.0	0.5		X	X	X	X				Associated field blank and trip collected with Parcel 83.
SD	HAND AUGER	P43-SD1D	12/19/07	14:20	1.0	1.5		X	X	X	X				Associated field blank and trip collected with Parcel 83.
SD	HAND AUGER	P43-SD2	12/19/07	14:50	0.0	0.5		X	X	X	X				Associated field blank and trip collected with Parcel 83.
SD	HAND AUGER	P43-SD2D	12/19/07	15:00	1.0	1.5		X	X	X	X				Associated field blank and trip collected with Parcel 83.
SD	HAND AUGER	P43-SD3	12/19/07	15:20	0.0	0.5		X	X	X	X				Associated field blank and trip collected with Parcel 83.
SD	HAND AUGER	P43-SD3D	12/19/07	15:30	1.0	1.5		X	X	X	X				Associated field blank and trip collected with Parcel 83.
IA	CANISTER	43IA-1	12/09/07	11:30	--	--		X							
BLANK	AMBIENT	43IA-AMBIENT	12/09/07	11:40	--	--		X							
SG	CANISTER	43SG-1	12/13/07	10:00	5.0	5.0		X							
SG	CANISTER	43SG-2	12/13/07	8:15	5.0	5.0		X							
SG	CANISTER	43SG-2 DUPLICATE	12/13/07	8:25	5.0	5.0		X							
SG	CANISTER	43SG-3	12/13/07	10:50	3.0	3.0		X							
SG	CANISTER	43SG-4	12/13/07	9:05	3.0	3.0		X							

X = Sample analyzed for the indicated analytical parameter suite

Table 3.9-3
Fort Monmouth Phase II Site Investigation, Parcel 43
Summary of Analytical Parameters Detected in Sediment (mg/kg)

Chemical	Sample ID:		Analytical Results					
	Lab ID:		P43-SD1	P43-SD1D	P43-SD2	P43-SD2D	P43-SD3	P43-SD3D
	Date Sampled:		7054801	7054802	7054803	7054804	7054805	7054806
	Depth (ft. bgs):		12/19/2007	12/19/2007	12/19/2007	12/19/2007	12/19/2007	12/19/2007
	Depth (ft. bgs):		0.0-0.5	1.0-1.5	0.0-0.5	1.0-1.5	0.0-0.5	1.0-1.5
	ER-L ¹	ER-M ²	Result	Result	Result	Result	Result	Result
Volatiles								
Acetone	NLE	NLE	0.330 J	0.290 J	0.220 J	0.380 J	0.330 J	0.210 J
Methylene Chloride	NLE	NLE	0.086 JB	0.073 JB	0.072 JB	0.450 U	0.520 U	0.360 U
Semi-Volatiles								
Anthracene	0.085	1.1	0.150 J	1.500 U	1.400 U	1.800 U	2.100 U	1.400 U
Benzo[a]anthracene	0.261	1.6	0.610 J	0.250 J	0.200 J	0.190 J	0.510 J	1.400 U
Benzo[a]pyrene	0.430	1.6	0.610 J	0.250 J	0.190 J	0.190 J	0.510 J	0.310 J
Benzo[b]fluoranthene	NLE	NLE	1.100 J	0.370 J	0.210 J	0.300 J	1.000 J	1.400 U
Benzo[k]fluoranthene	0.240	NLE	0.340 J	0.170 J	0.160 J	0.095 J	0.390 J	1.400 U
bis(2-Ethylhexyl)phthalate	NLE	NLE	0.780 JB	0.560 JB	0.440 JB	0.720 JB	1.400 JB	0.350 JB
Chrysene	0.384	2.8	0.860 J	0.320 J	0.250 J	0.280 J	0.880 J	1.400 U
Di-n-butylphthalate	NLE	NLE	1.800 U	1.500 U	0.098 JB	1.800 U	2.100 U	1.400 U
Fluoranthene	0.600	5.1	1.400 J	0.520 J	0.380 J	0.490 J	1.300 J	0.120 J
Phenanthrene	0.240	1.5	0.700 J	0.280 J	0.210 J	0.200 J	0.520 J	1.400 U
Pyrene	0.665	2.6	1.600 J	0.600 J	0.450 J	0.480 J	1.400 J	0.140 J
Metals								
Aluminum	NLE	NLE	13700 B	11000 B	14500 B	8380 B	16400 B	28100 B
Arsenic	8.2	70	7.48	6.58	10.2	5.99	7.99	7.87
Barium	NLE	NLE	83.5 B	69.5 B	52.4 B	69.4 B	67.0 B	168 B
Beryllium	NLE	NLE	3.22	2.50	2.01	1.62	2.97	3.21
Cadmium	1.2	9.6	1.86	1.34	0.358	1.67	1.67	0.854
Calcium	NLE	NLE	2320 B	1500 B	1490 B	1410 B	1300 B	2130 B
Chromium (Total)	81	370	155 B	125 B	161 B	71.9 B	155 B	473 B
Cobalt	NLE	NLE	20.1	20.1	15.7	11.9	6.01	0.940
Copper	34	270	39.4 B	32.5 B	53.6 B	20.7 B	29.1 B	12.0 B
Iron	NLE	NLE	66800 B	45200 B	47800 B	21300 B	39600 B	97400 B
Lead	47	218	74.6	58.8	116	29.5	45.0	13.6
Magnesium	NLE	NLE	5490	4720	5170	2240	5190	15500
Manganese	NLE	NLE	152 B	45.8 B	140 B	38.0 B	31.6 B	29.3 B
Mercury	0.15	0.71	0.47	0.31	0.25	0.26	0.28	0.132 U
Nickel (Soluble Salts)	21	52	36.4	36.0	28.3	24.6	23.7	9.11
Potassium	NLE	NLE	10700 B	9620 B	9580 B	3790 B	10200 B	30100 B
Vanadium	NLE	NLE	79.1	60.9	81.1	43.2	75.4	161
Zinc	150	410	286 B	237 B	108 B	157 B	252 B	84.0 B

¹ NJDEP Marine/Estuarine Sediment Screening Guidelines, Effects Range - Low.

² NJDEP Marine/Estuarine Sediment Screening Guidelines, Effects Range - Medium.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte detected.

Shaded = Concentration exceeds ER-L.

Table 3.9-4
Fort Monmouth ECP Site Investigation, Parcel 43
Summary of Analytical Parameters Detected Soil Gas (ug/m³)

Chemical	Sample ID: Lab ID: Date Sampled: Depth (ft. bgs):	Analytical Results				
		43SG-1	43SG-2	43SG-2 DUP	43SG-3	43SG-4
		J79249-10	J79249-11	J79249-14	J79249-12	J79249-13
		12/13/07	12/13/07	12/13/07	12/13/07	12/13/07
	SG Non-residential ²	5'	5'	5'	3'	3'
		Result	Result	Result	Result	Result
Volatiles						
Acetone	230,000	124	130	62.7	34.4	51.1
Benzene	26	5.8	8.0	3.5 J	3.1 J	3.1 J
Carbon disulfide	51,000	12	11	5.3	7.5	4.0 J
Dichlorodifluoromethane	13,000	5.4 J	<2.3	<2.3	<2.3	<2.3
cis-1,2-Dichloroethylene	2,600	172	<1.7	<1.7	<1.7	132
trans-1,2-Dichloroethylene	5,100	5.6 J	<1.4	<1.4	<1.4	<1.4
1,2-Dichloroethylene (total)	2,300	177.6 J (a)	<1.7 (a)	<1.7 (a)	<1.7 (a)	132 (a)
Ethanol	NLE	26.9	53.9	17	12	16
Ethylbenzene	74,000	113	4.8 J	<0.65	132	<0.65
2-Hexanone	NLE	<1.6	<1.6	<1.6	<1.6	8.6
4-Methyl-2-pentanone (MIBK)	220,000	<0.82	6.6	8.6	<0.82	11
Methyl ethyl ketone	360,000	<0.91	4.4 J	4.7	<0.91	5.6
Methyl tertiary butyl ether (MTBE)	180	<1.3	5.8	<1.3	<1.3	<1.3
Propylene	NLE	<1	69.9	39.2	23.5	44.8
Tetrachloroethylene	36	162	78.7	107	285	135
Toluene	360,000	535	24	11	535	15
Trichloroethylene	27	1130	<1.3	8.6	44	763
1,2,4-Trimethylbenzene	NLE	4.6 J	12	<0.84	4.5 J	9.3
Xylenes (m&p)	NLE	491	18	<1.3	586	12
o-Xylene	NLE	109	6.1 J	<0.74	133	<0.74
Xylenes (total)	7,700	599	24	<0.74	721	12

¹ NJDEP Generic Vapor Intrusion Screening Levels, Soil Gas Screening Levels, Residential, March 2007.

² NJDEP Generic Vapor Intrusion Screening Levels, Soil Gas Screening Levels, Nonresidential, March 2007. Results were compared to these levels.

(a) = Sum of cis-1,2-Dichloroethylene and trans-1,2-Dichloroethylene.

J = Indicates an estimated value.

DUP = Duplicate Sample

NLE = No Limit Established

Bold = Detection

Shaded = Exceedance of SG Nonresidential.

Table 3.9-5
Fort Monmouth ECP Site Investigation, Parcel 43
Summary of Analytical Parameters Detected Indoor Air (ug/m³)

Chemical	Sample ID: Lab ID: Date Sampled:		Analytical Results	
			43IA-1	43IA-AMBIENT
			J78674-18	J78674-19
			12/09/07	12/09/07
	RAL ³	IA Non-residential ²	Result	Result
Volatiles				
Acetone	6,600	4,600	496	5.7
Benzene	14	2	2.6	1.4
Chloromethane	NLE	130	1.2	1.2
Cyclohexane	NLE	8,700	0.96	<0.15
Dichlorodifluoromethane	NLE	260	5.4	2.7
Dichloromethane	400	9	15	0.76
Ethanol	NLE	NLE	49.2	5.3
Ethyl Acetate	NLE	NLE	84.2	<0.3
Ethylbenzene	2,200	1,500	3.8	0.43 J
4-Ethyltoluene	NLE	NLE	5.9	<0.084
n-Heptane	NLE	NLE	3.0	0.49 J
Isopropyl Alcohol	NLE	NLE	<0.15	0.93
Methyl ethyl ketone	NLE	7,200	17	0.53 J
Methyl tertiary butyl ether (MTBE)	200	4	0.87	<0.17
Propylene	NLE	NLE	12	2.9
Tetrahydrofuran	NLE	NLE	0.75 J	<0.16
Toluene	10,000	7,200	199	2.5
1,1,1-Trichloroethane	NLE	1,400	0.65 J	<0.27
Trichlorofluoromethane	NLE	1,000	1.6	1.5
1,2,4-Trimethylbenzene	NLE	NLE	19	<0.1
1,3,5-Trimethylbenzene	NLE	NLE	6.9	<0.088
2,2,4-Trimethylpentane	NLE	NLE	2.4	0.47 J
o-Xylene	NLE	NLE	5.2	0.48 J
Xylenes (m&p)	NLE	NLE	13	1.4
Xylenes (total)	220	150	19	1.9

¹ NJDEP Generic Vapor Intrusion Screening Levels, Indoor Air Screening Levels, Residential, March 2007.

² NJDEP Generic Vapor Intrusion Screening Levels, Indoor Air Screening Levels, Nonresidential, March 2007. Results were compared to these levels.

³ NJDEP Rapid Action Levels for Indoor Air, March 2007.

J = Indicates an estimated value.

DUP = Duplicate Sample

NLE = No Limit Established

Bold = Analyte detected

Shaded = Concentration exceeds of IA Nonresidential.

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P43SD-1	SD	0.0-0.5	Anthracene	0.150 J	ER-L/ER-M	0.085/1.1
P43SD-1	SD	0.0-0.5	Chrysene	0.860 J	ER-L/ER-M	0.384/2.8
P43SD-1	SD	0.0-0.5	Phenanthrene	0.700 J	ER-L/ER-M	0.240/1.5
P43SD-1	SD	0.0-0.5	Cadmium	1.86	ER-L/ER-M	1.2/9.6
P43SD-1	SD	0.0-0.5	Chromium	155 B	ER-L/ER-M	81/370
P43SD-1	SD	0.0-0.5	Lead	74.6	ER-L/ER-M	47/218
P43SD-1	SD	0.0-0.5	Zinc	286 B	ER-L/ER-M	150/410
P43SD-1D	SD	1.0-1.5	Cadmium	1.34	ER-L/ER-M	1.2/9.6
P43SD-1D	SD	1.0-1.5	Chromium	125 B	ER-L/ER-M	81/370
P43SD-1D	SD	1.0-1.5	Zinc	237 B	ER-L/ER-M	150/410

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P43SD-3	SD	1.0-1.5	Phenanthrene	0.520 J	ER-L/ER-M	0.240/1.5
P43SD-3	SD	0.0-0.5	Chrysene	0.880 J	ER-L/ER-M	0.384/2.8
P43SD-3	SD	0.0-0.5	Cadmium	1.67	ER-L/ER-M	1.2/9.6
P43SD-3	SD	0.0-0.5	Chromium	155 B	ER-L/ER-M	81/370
P43SD-3	SD	0.0-0.5	Zinc	252 B	ER-L/ER-M	150/410
P43SD-3D	SD	1.0-1.5	Chromium	473 B	ER-L/ER-M	81/370

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P43SD-2	SD	0.0-0.5	Chromium	161 B	ER-L/ER-M	81/370
P43SD-2	SD	0.0-0.5	Copper	53.6 B	ER-L/ER-M	34/270
P43SD-2	SD	0.0-0.5	Lead	116	ER-L/ER-M	47/218
P43SD-2D	SD	1.0-1.5	Cadmium	1.67	ER-L/ER-M	1.2/9.6

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m3)	Criteria	Criteria Value (ug/m3)
43SG-2	SG	5	PCE	78.7	SG Non-residential	36
43SG-2 DUP	SG	5	PCE	107	SG Non-residential	36

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m3)	Criteria	Criteria Value (ug/m3)
43SG-4	SG	3	PCE	135	SG Non-residential	36
43SG-4	SG	3	TCE	763	SG Non-residential	27

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m3)	Criteria	Criteria Value (ug/m3)
43SG-1	SG	5	PCE	162	SG Non-residential	36
43SG-1	SG	5	TCE	1130	SG Non-residential	27

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m3)	Criteria	Criteria Value (ug/m3)
43IA-1	IA		Benzene	2.6	IA Non-residential	2
43IA-1	IA		Dichloromethane	15	IA Non-residential	9

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m3)	Criteria	Criteria Value (ug/m3)
43SG-3	SG	3	PCE	285	SG Non-residential	36
43SG-3	SG	3	TCE	44	SG Non-residential	27

LEGEND

- * Soil-Gas Sample Location
- ◆ Indoor Air Sample Location
- ▲ Sediment Sample Location
- Generalized Groundwater Flow Direction.
Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- IRP Site Boundary

ECP PARCEL CATEGORY DEFINITIONS

- 7 Areas that are not evaluated or require additional evaluation.

* Parcel not included in Site Investigation. Information pertaining to parcels not included in this Site Investigation is presented in the Fort Monmouth Phase I ECP Report (January 2007).

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

CONTAMINATION DESCRIPTION

CATEGORY NUMBER

PARCEL NUMBER

HS - Hazardous Substance Storage

HR - Hazardous Substance Release

PS - Petroleum Storage

PR - Petroleum Release

(P) - Possible Release or Disposal

N

SCALE:

0 37.5 75 150

Feet

USAEC

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw

Shaw Environmental, Inc.

FIGURE 3.9-1

FORT MONMOUTH ECP SITE INVESTIGATION

PARCEL 43 SAMPLE LOCATIONS AND CONSTITUENTS OF CONCERN

MAIN POST FORT MONMOUTH NEW JERSEY